2 Sheets—Sheet 1

J. B. FELTER.

Door-Lock.

No. 199,048. Patented Jan. 8, 1878.

Fig 5

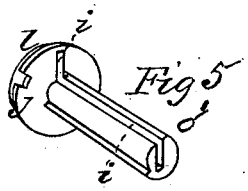


Fig 1

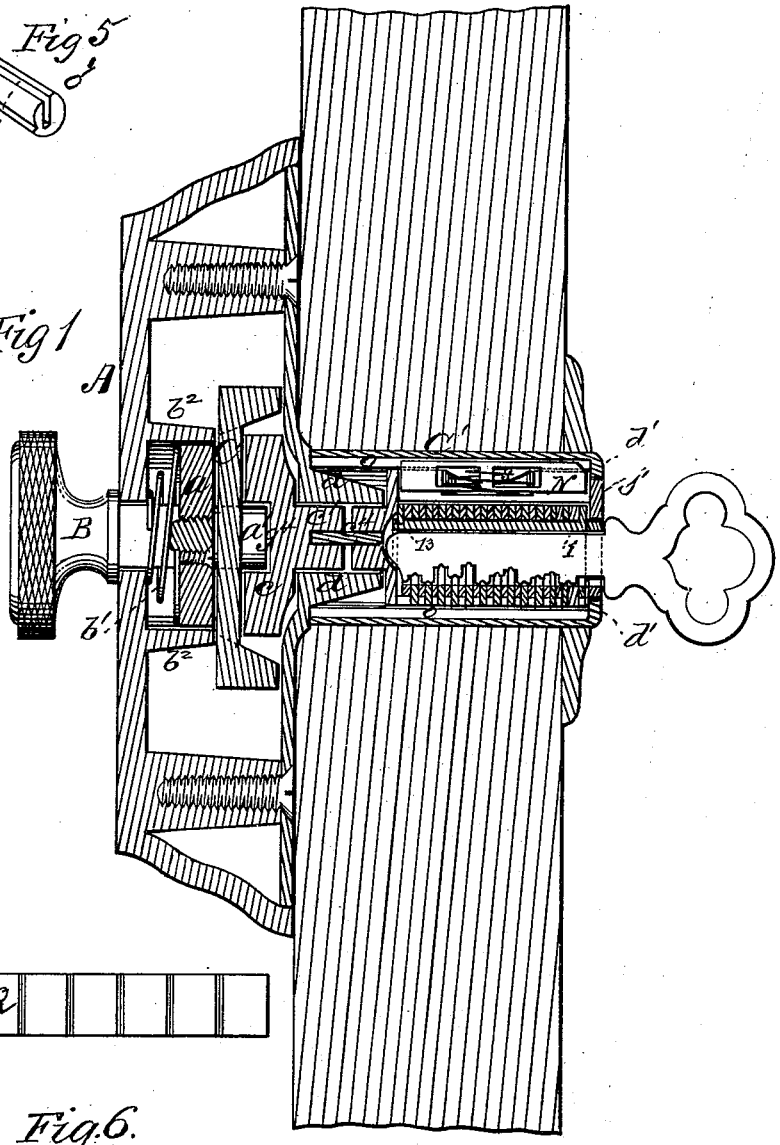
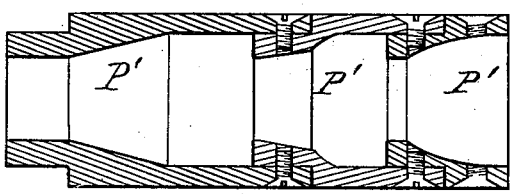


Fig. 6.



WITNESSES

Willett & Anderson

F. J. Masi

INVENTOR

James B. Felter.

by E. W. Anderson

ATTORNEY

2 Sheets—Sheet 2.

J. B. FELTER.

Door-Lock.

No. 199,048. Patented Jan. 8, 1878.

Fig 2

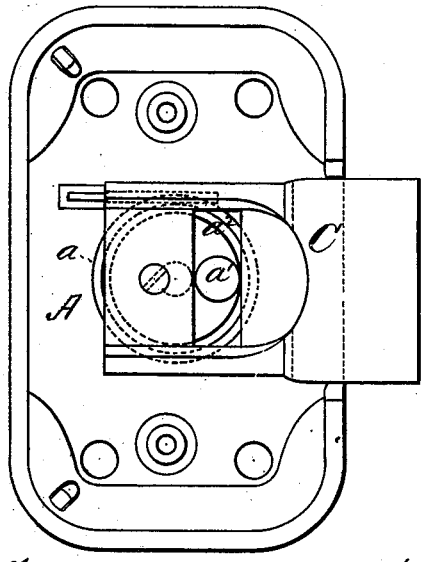


Fig 3

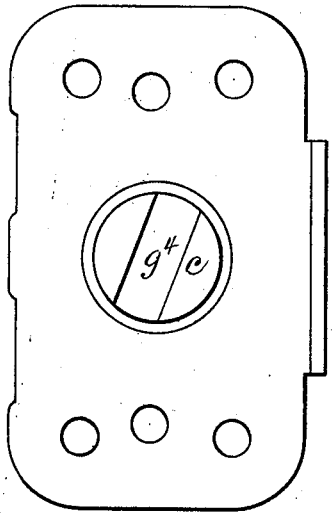


Fig 4

Fig. 7.

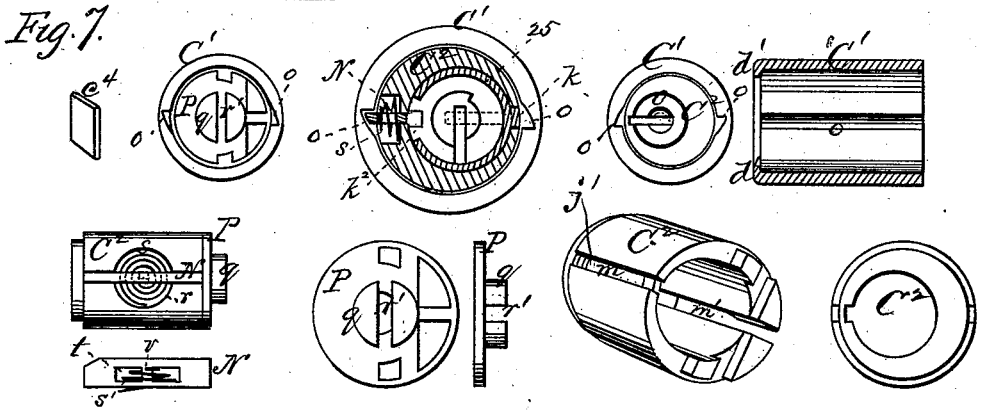
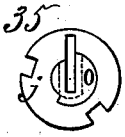


Fig 35



WITNESSES

Villette Anderson.

F. J. Mase

INVENTOR

James B. Felter,

by E. W. Anderson,

ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES B. FELTER, OF CAZENOVIA, NEW YORK.

IMPROVEMENT IN DOOR-LOCKS.

Specification forming part of Letters Patent No. **199,048**, dated January 8, 1878; application filed November 24, 1877.

To all whom it may concern:

Be it known that I, JAMES B. FELTER, of Cazenovia, in the county of Madison and State of New York, have invented a new and valuable Improvement in Door-Locks; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a vertical section of my improved lock applied to a door. Fig. 2 is an inside view of the lock-case, showing the bolt and its appurtenances. Fig. 3 is a view of the lock-case cap, showing the subsidiary hub; and Figs. 4 to 35 are detail views of parts.

This invention has relation to improvements in locks.

The nature of the invention consists in the combination of parts, substantially as hereinafter shown and described in the claims.

In the annexed drawings, the letter A designates the lock-case, secured in the usual manner to the inside of the door. B designates a knob extending through the outer wall of the lock, and provided upon its inner end with a circular hub, *a*, carrying a crank-pin, a^1, projecting through an oblong slot, a^2, formed in a bolt, C. Between the hub *a* and the outer wall of the case is arranged a spring, b^1, for a purpose hereinafter explained. The hub *a* has its bearings in an annular flange, b^2, projecting inward from the case, which flange also incloses the said spring.

It is evident that by turning the knob the bolt will be alternately shot and retracted, the rotary motion of the former being converted into a rectilinear motion for the bolt by the crank-pin and slot. The inner surface of the bolt is recessed, and receives a secondary hub, *c*, having on its under side a diametrical groove, g^4, in which the wrist-pin a^1 is engaged, and upon its opposite side a transversely-grooved cylindrical spur, c^1, that extends through the inner wall of the case. The groove c^2 is like the cut in the head of a screw, and serves to receive a plate of metal, c^4, of a length corresponding to the thickness of the door which connects the secondary hub and bolt with the mechanism for operating the said bolt from the outside. This mechanism is inclosed within a metallic cylinder, C^1, extending through the door, and rigidly secured to an annular flange upon the cap-plate of the lock-case, which plate is secured to the said case in any suitable manner. By drawing outward upon the knob spring b^1 yields, and the wrist-pin a^1 of the primary hub *a* is disengaged from the secondary hub *c*, which allows the lock-bolt to be shot or retracted from the inside without affecting the mechanism for opening from the outside—this for a reason hereinafter set forth, and for the purpose of diminishing friction. The cylinder C^1 is open, but its outer end is provided with a flange, d', projecting inward, leaving a reduced opening, through which the rabbeted end of an inside cylinder, C^2, extends. This cylinder is eccentrically hollow, and fits snugly within the stationary cylinder C^1. It rotates freely therein under circumstances hereinafter explained, and contains the tumblers, numbered from 1 to 13, strung upon the key-guide post o'. This key-guide post has upon one end an enlarged head, *l*, which fits snugly in the open end of the cylinder C^2, and is slotted, as shown at *i*, for the entrance of the key. This slot is carried through a circular base-plate, *j*, resting, when the said post is in position, upon an inwardly-projecting flange, j', of the cylinder C^2, and is continued from end to end of the post, as shown at i'. These tumblers, from No. 1 to No. 13, which latter is the tumbler-guide, have each a false and a true notch or notches, the former being intended to deceive a burglar, who, in endeavoring to pick the lock, will be unable to determine when the true notches are in line.

The irregular recess shown in the side of the post is for the purpose of disarranging the true notches in withdrawing the key, and for readjusting the said tumblers, so that the key will enter by turning backward with the point of the key.

The tumblers are strung, the one after the other, upon the key-post, commencing with No. 1 and ending with No. 13, each tumbler being separated from the next by a split ring, 25, having a projecting edge-spur, *k*. These rings are so arranged that the spurs *k* are in line

with each other, as are also the clefts k', and when the tumblers are placed in the cylinder C^2 the said spurs are engaged with a longitudinal slot, m, and the clefts k', in line with a second slot, m', in the walls of the case-cylinder C^2. Being engaged with the slot m, the rings 25 are immovable, and prevent one of the tumblers from moving an adjoining one. The irregular side x of the hole in the tumblers 3 to 11, or the series of notches, as in tumbler No. 27, permits the key to bear thereon in different places, according to its width at that particular point, and enables me to make a large number of combinations, with no two keys alike. The locks are fitted to the keys, instead of the key to the lock, by sawing the true notch in the tumblers with the key in and turned to position, the first tumbler being notched according to the combination selected. The key-guide No. 13 conforms to the general shape of the post, and is slotted to receive the end of the key. It is riveted or otherwise secured to the key, and turns therewith independently of the tumblers, and in unison with the base-plate j above described. The intermediate tumblers, from 2 to 12, turn upon the shaft when the notched edge of the key comes around and presses against the irregular side of the aperture, this rotation being greater or less according to the depth of the key-notches. The deeper these notches the less the rotation of the tumblers, which will continue until the said key abuts against the shoulder n of the orifice, the deep notch in the tumblers being then in line with the slot m' and the clefts in the rings, the cylinder-case C^2 up to this moment being held stationary by means of a locking-plate, N, having a beveled outer edge, and engaging an angular groove, o, formed in the escutcheon-cylinder C^1, one at each side, and extending from end to end thereof. If the movement be continued, the plate N is forced back out of the groove o into the case and notches of the tumblers, and the said case turns with the said tumblers a half-rotation when the said plate is sprung into the other groove o of the escutcheon by a conical spring, s. The tumbler-case C^2 is closed at its inner end by a cap, P, having a projecting spur, q, provided with a transverse nick, r', which receives one end of a metallic connecting-plate, c^4, the other end of which is engaged with the corresponding nick in the secondary hub above described.

It is evident that when the cylinder C^2 is turned by the operation aforesaid it will shoot and retract the bolt through the medium of the hubs a c. The locking-plate N aforesaid is provided with a longitudinal slot, t, in which the conical spring s is seated, being maintained in position by being coiled around a post, v. This spring is seated in a circular recess, r, in the outer surface of the tumbler-case. The bolt is shot by inserting the key and turning to the right until a click is heard, produced by the entrance of the locking-plate N into the groove o, and withdrawn from the lock by giving it a fourth turn back.

The cylinder C^1 is sometimes too short to reach through the door, in which event I attach one or more rings, P', of the same or different lengths, to the cap-plate of the lock-case and the escutcheon-cylinder C^1 with screws or otherwise, using a metallic blade, Q, to complete the connection. This blade is grooved to correspond with all the lengths of rings furnished, and may be easily broken at the proper groove.

What I claim as new, and desire to secure by Letters Patent, is—

1. A tumbler-guide slotted and recessed as described, in combination with a circular tumbler having an irregular hole as key-bearing, substantially as specified.

2. The locking-bar N and its conical spring, in combination with the cylinder C^2, having recess r and slot m, the tumblers 3 to 11, notched to receive said bar, and the cylinder C^1, having the beveled notches o, substantially as specified.

3. The combination of the bar N, having slot t and post v, with the conical spring seated in said slot, and embracing the said post, substantially as specified.

4. The rings P', of the same or different lengths, in combination with the correspondingly-grooved blade Q and the escutcheon-cylinder C^1 of a tumbler-lock mechanism, substantially as specified.

5. The combination, with the slotted bolt C, of the knob-hub a, having crank-pin a^1, and the connecting-hub c, having transverse groove g^1 engaging said pin, substantially as specified.

6. The combination, with the hub a, having crank-pin a^1, the grooved hub c, and the intermediate slotted bolt C, of the spring b^1 between the hub a and the lock-case, substantially as specified.

7. The combination, with the tumbler-case C^2, having the grooved head P, and the recessed connecting-hub c, having the grooved head c^1, of the connecting-plate c^4, engaging the said grooved heads, the slotted bolt C, the hub a, having crank-pin a^1, and the spring b^1 between the hub a and the bolt-case, as set forth.

8. The plate Q, having the transverse grooves, in combination with the ring or rings P', as set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JAMES B. FELTER.

Witnesses:

CHAS. B. CANNON,

M. J. STONE.